Abstract Submitted
for the DPP19 Meeting of
The American Physical Society

Simulations of isolated defects in planar plastic foils[1] ANDREW J. SCHMITT, CALVIN ZULICK, A.L. VELIKOVICH, MAX KARASIK, YEFIM AGLITSKIY, Plasma Physics Division, NRL — Experiments at the Naval Reearch Laboratory have been performed to examine the hydrodynamic response of laser irradiated planar foils that include isolated, structured defects. In particular we have examined the evolution of long channel-like structures of varying widths and depths in accelerated planar CH foils driven by 4 nsec pulses at about $5 \times 10^{13} W/cm^2$ with the Nike laser. The Nike KrF laser overlaps up to 44 beams with state-of-the-art echelon-free ISI optical smoothing with 1 THz bandwidth, providing extremely smooth irradiation of the flat targets. The experiments were diagnosed with both face-on and side-lit radiography using monochromatic curved-crystal imagers. This measured evolution involves growth of both the isolated defect and the background perturbations (laser imprint and surface finish irregularities) by the Richtmyer-Meshkov and Rayleigh-Taylor instabilities. We will present simulations of both 2D and 3D FASTrad3D radiation-hydrodynamic modeling of these experiments and discuss both the observed similarities and differences.

[1]supported by US DoE/NNSA

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Date submitted: 03 Jul 2019 Electronic form version 1.4